



PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Applicant : Larry W. Hrubesh Attorney Docket : IL-10413
Serial No. : 10/050,437 Art Unit : 1754
Filed : January 15, 2002 Examiner : P. Lish
For : Lightweight, High Strength Carbon
Aerogel Composites and Method of Fabrication

BRIEF ON APPEAL

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11/25/2005 MGE BREM1 00000106 501913 10050437

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This is an appeal to the Board of Patent Appeals and Interferences from the final rejection of Claims 1, 4, 8 and 18 mailed April 19, 2005. On August 19, 2005, a timely Notice of Appeal was filed.

I. REAL PARTIES IN INTEREST

The real parties in interest are the Regents of the University of California and the United States of America as represented by the United States Department of Energy.

II. RELATED APPEALS AND INTERFERENCES

Appellant knows of no other appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1, 4, 8 and 18 are pending on appeal and stand rejected. The rejection of claims 1, 4, 8 and 18 is appealed. Claims 2, 3, 5-7, 9-17 and 19 were previously canceled. A copy of the claims on appeal is set forth in the Claims Appendix.

IV. STATUS OF AMENDMENTS

All amendments have been entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 is a method for producing carbon aerogel composites comprising the steps of (i) infiltrating a solution containing a plurality of carbon aerogel precursors into a pre-formed polymer foam, or fiber-mat (paragraph 13, lines 5-6), (ii) allowing said solution to gel such that it encapsulates at least part of the pre-formed polymer foam or fiber-mat to form a gelled composite (paragraph 13, lines 6-7), (iii) drying the gelled composite to form a dried composite such that the surface tensile forces are reduced (paragraph 13, lines 7-9), and (iv) pyrolyzing the dried composite wherein the preformed polymer foam or fiber-mat and the carbon aerogel decompose simultaneously such that they remain essentially in contact at their interfaces to form a monolithic glassy carbon material (paragraph 13, lines 9-13).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1 and 18 are anticipated by Droege.

Whether claims 4 and 8 are unpatentable over Droege.

Whether claims 1, 4, 8 and 18 are unpatentable over Pekala et al in view of Kaschmitter et al.

VII. ARGUMENT

Are claims 1 and 18 anticipated by Droege?

As indicated in the Declaration under 37 CFR §1.132 filed January 20, 2005, claim 1 of the present patent application includes a drying step that reduces surface tensile forces so that the organic aerogel and the preformed polymer foam/fiber-mat that it encapsulates, are essentially monolithic. After pyrolysis, they remain essentially in contact at their interfaces to form a monolithic glassy carbon material. Claim 1 recites: "drying the gelled composite to form a dried composite such that the surface tensile forces are reduced." As discussed in the Declaration, the Droege reference teaches a drying method that does not reduce surface tensile forces adequately to produce a monolithic composite, nor to form an essentially monolithic composite when pyrolyzed. The reference does not teach how to produce an essentially monolithic foam/mat aerogel composite. Claim 18 should be allowable at least because it depends from claim 1. Therefore the rejection should be withdrawn.

Are claims 4 and 8 unpatentable over Droege?

Claims 4 and 8 should be allowable at least because they depends from claim 1, which should be allowable over Droege as discussed above. Therefore the rejection should be withdrawn.

Are claims 1, 4, 8 and 18 unpatentable over Pekala et al in view of Kaschmitter et al?

As indicated in the Declaration under 37 CFR §1.132 filed January 20, 2005, in both Pekala and Kaschmitter, the pore size is required to be large enough so that fluid

(electrolyte) can flow. Thus, neither reference teaches a method for producing a monolithic foam/mat aerogel composite. The composites produced by the Pekala and Kashmitter patents do not exhibit the same bulk properties as a monolithic aerogel because the average pore size is relatively large. In fact, such large pores, which enable easy fluid transport through the material, are essential for the application of energy storage. Therefore the rejection should be withdrawn.

Accordingly it is submitted that the rejections of claims 1, 4, 8 and 18 are improper and should be reversed.

Respectfully submitted,

A handwritten signature in black ink, reading "John P. Wooldridge". The signature is written in a cursive, flowing style with a horizontal line underneath the name.

John P. Wooldridge
Attorney for Appellants
Registration No. 38,725
Tel. No. (808) 875-0012

Dated: November 21, 2005

VIII. CLAIMS APPENDIX

1. A method comprising:

infiltrating a solution containing a plurality of carbon aerogel precursors into a pre-formed polymer foam, or fiber-mat, allowing said solution to gel such that it encapsulates at least part of the pre-formed polymer foam or fiber-mat to form a gelled composite, drying the gelled composite to form a dried composite such that the surface tensile forces are reduced, and pyrolyzing the dried composite wherein the preformed polymer foam or fiber-mat and the carbon aerogel decompose simultaneously such that they remain essentially in contact at their interfaces to form a monolithic glassy carbon material.

4. The method of Claim 1, wherein allowing said solution containing a plurality of carbon aerogel precursors to gel is carried out at a temperature of 80°C and a time period of 110 minutes.

8. The method of Claim 1, wherein pyrolyzing the dried composite is carried out in a furnace in the temperature range of 700 to 1100°C and for a time period of 8 to 12 hours.

18. The method of Claim 1, wherein said drying is carried out by supercritical carbon dioxide exchange.



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FEE AUTHORIZATION FOR FILING A BRIEF IN SUPPORT OF APPEAL UNDER
37 CFR 1.17(c)

The fee required for filing a Brief in support of an appeal is \$500.

The applicant is a small entity. Therefore the fee is \$250.

The Commissioner is hereby authorized to deduct the required fee (\$250.)
from Deposit Account 501913.

Respectfully submitted,

John P. Wooldridge
Attorney for Appellants
Registration No. 38,725
Tel. No. (808) 270-1011

Dated: November 21, 2005